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Military Medical Treatment Facilities (MTFs) experience higher admission rates than civilian facilities. The military setting may present valid reasons for inpatient versus outpatient treatment, but the possibility remains that these resources might not be used as appropriately as possible. A study of surgical utilization at Madigan Army Medical Center (MAMC) for fiscal year (FY) 1994 was conducted. A comparison of inpatient surgeries performed at MAMC in FY94 with the Health Care Financing Administration's (HCFA's) most current list of approved ambulatory surgeries was done. The results showed that 65% of a subset consisting of 77 inpatient surgeries met the ambulatory surgery criteria and amounted to $89,936 in resource utilization. The subsample containing 1047 records meeting the ambulatory surgery criteria, with a 26% error rate and averaging 1.14 additional days length of stay, amounted to $587,504 expended on inpatient resources in FY94 that may have been more appropriately spent in the outpatient arena. The demographic data showed the greatest percentage (60%) of inpatient surgeries meeting the criteria to be the Sponsor. Opportunities for shifting resources for better utilization were identified and validated against similar civilian sector experiences.

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Graduate Program in Health Care Administration

AMBULATORY SURGERY UTILIZATION AT MADIGAN ARMY MEDICAL CENTER

A Graduate Management Project

Submitted to

The Faculty of Baylor University

by

Lieutenant Cathi L. Culver

Madigan Army Medical Center

Fort Lewis, Washington

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ABSTRACT

Military Medical Treatment Facilities (MTFs) experience higher admission rates than civilian facilities. The military setting may present valid reasons for inpatient versus outpatient treatment, but the possibility remains that these resources might not be used as appropriately as possible. Some of these admissions may be for other than medically indicated reasons. A study of surgical utilization at Madigan Army Medical Center (MAMC) for fiscal year (FY) 1994 was conducted. A comparison of inpatient surgeries performed at MAMC in FY 1994 with the Health Care Financing Administration's (HCFA's) most current list of approved ambulatory surgeries was done. The results showed that 65% of a subset consisting of 77 inpatient surgeries met the ambulatory surgery criteria and amounted to $89,936 in resource utilization. The subsample containing 1047 records meeting the ambulatory surgery criteria, with a 26% error rate and averaging 1.14 additional days length of stay, amounted to $587,504 expended on inpatient resources in FY94 that may have been more appropriately spent in the outpatient arena. The demographic data showed the greatest percentage (60%) of inpatient surgeries meeting the ambulatory criteria to be the Sponsor. Opportunities for shifting resources for better utilization were identified and validated against similar civilian sector experiences.

TABLE OF CONTENTS

LIST OF TABLES

INTRODUCTION

It is essential to health care organizations that unique, innovative methods of managing resources be implemented in the wake of a health care environment that is rapidly changing (Clement and Sangermano 1992). Identified long ago as one means of better managing the health care dollar has been the multiple advantages of ambulatory surgery.

Military treatment facilities (MTFs) have historically been slower to embrace the shift to outpatient care than their civilian counterparts, mainly because survival has not been based on third party reimbursement or efficient operation. Prior to 1983, civilian hospitals, like military facilities had also been reimbursed for work performed. As with MTFs, this equated to a high number of inpatient admissions and long average lengths of stay (ALOS). The shift to prospective reimbursement in 1983 reversed this scenario for the civilian sector and as much care as possible was shifted to the outpatient setting. This included a large portion of surgical procedures.

Military medicine has been slower to follow this outpatient shift. The government pays for most of its federal programs through appropriated funding based on historical spending

patterns. Providers and administrators alike rarely worried about costs under this system because medical facilities were reimbursed what they had historically spent.

The Military Health Care System (MHCS) is now facing unprecedented levels of environmental instability, financial uncertainty, and organizational volatility. In the wake of national health care reform, military leaders are facing the same constraints that have already been well introduced to their civilian counterparts. Challenges of containing MHCS costs, improving access, and sustaining quality in the face of a downsizing force have brought managed care to the forefront of military medicine (Hudak, Brooke, and Finstuen 1994).

In an effort to restructure military medical health care delivery and reshape its financing, the Department of Defense's (DOD's) medical assets were reorganized. The United States was split into twelve regions, each containing a major medical center. Capitated budgeting for patient populations within each region was instituted, forcing military medicine to operate in a more efficient manner. Military medical leaders must now prepare for a future where fiscal challenges will intensify as they strive to meet the medical needs of their beneficiaries.

Cost constraints have aided the Health Care Financing Administration (HCFA) in continually adding to its list of surgical procedures approved for Medicare reimbursement on an outpatient basis. Currently there are 2500 surgical procedures listed (Hospital Statistics 1992-93). For years, civilian

facilities have been relying on this list to gauge their Medicare reimbursement and balance their fiscal viability by maintaining an appropriate mix of inpatients and outpatients.

Unlike civilian facilities, MTFs have not had to rely on third party payer reimbursement for their financial stability. The shift to outpatient care for the military has come widely from advances in technology and a desire to remain on the cutting edge of medicine rather than changes in payment mechanisms. Managed care and capitated budgeting are now forcing MTF commanders to more closely examine how their medical resources are being expended.

Military medical facility commanders must better manage the services they provide in order to meet their capitated budgets. Because ambulatory surgery has become one of the premier managed-care strategies (Vaughan, Aluise, and McLaughlin 1991), it is reasonable to assume that ambulatory surgeries performed by a major medical center such as Madigan Army Medical Center (MAMC) should mirror HCFA's list of approved outpatient procedures. A review of inpatient surgeries at Madigan will demonstrate whether or not this is indeed occurring. Those procedures that could have been performed on an outpatient basis will be identified with resultant potential cost savings reflected based on the findings.

Conditions Which Prompted The Study

The military medical system has previously been workload reimbursed. This method created numerous unnecessary admissions and long lengths of stay (LOS). In the wake of health care reform, the nation has been split into twelve regions, each containing a major military medical center. The MTFs in each region are expected to care for their beneficiary population under a capitated budget. This means that a fixed amount of money is provided to care for a given population. This form of Managed Care is forcing treatment facility Commanding Officers to rethink how they do business in order to remain fiscally viable while caring for their regional populations.

Madigan Army Medical Center is a premier teaching hospital and tertiary care referral center located at Fort Lewis, Washington. It is the major medical center located in Region 11, responsible for coordinating and delivering care for beneficiaries located in Washington and Oregon.

MAMC performs approximately 9300 surgeries annually and of those about 3000 are performed on an ambulatory basis. To date there has been no evaluation of the utilization of MAMC's ambulatory capability. Comparison to HCFA's approved list will demonstrate whether or not MAMC is performing as many types of ambulatory surgeries as it could be expected to perform.

It is a possibility that military treatment facilities admit patients for reasons other than medical necessity. These types of admissions may include a soldier with a contagious process

such as chicken pox who cannot be returned to the barracks, a patient who arrived via aeromedical evacuation for a minor surgical procedure and is awaiting the next available flight out, or a single soldier who has no access to support services like meals and laundry at their place of residence. If this is the case, then resources that are being used to provide inpatient services might better be redirected toward alternative management solutions.

An analysis of inpatient admissions will identify any opportunity for potential cost savings in inpatient surgeries that could have been performed on an outpatient basis. If potential cost savings can be identified, alternative management solutions can be considered such as increasing recovery room staff or altering staff scheduling, initiation of a minimal care ward, contracting out for those ambulatory surgeries that frequently require one pre or postoperative day, dedicated billeting arrangements, or resource sharing with the contractor.

Statement of the Problem

The majority of surgical procedures performed at Madigan Army Medical Center (69%) are done on an inpatient basis. Current literature and financial reimbursement strategies suggest that significant opportunities exist to shift more surgical procedures to an outpatient ambulatory setting at considerable cost savings. Do these same opportunities exist at Madigan and what is the potential for better resource utilization?

Purpose

The purpose of this project is twofold. First, to analyze FY 1994 surgical procedure data in order to identify opportunities where resources were utilized for inpatient care when outpatient treatment may have been more appropriate. Second, to suggest more efficient and effective resource utilization strategies that will take advantage of and capitalize on current surgical practice in the civilian sector.

Literature Review

Ambulatory surgery has been defined as those surgeries that encompass surgical intervention that are more complex than office-based procedures performed under local anesthesia but less complex than major procedures requiring at least an overnight stay or more prolonged hospitalization (Detmer 1981). It has also been defined as operative procedures performed in a surgical facility where admission and discharge of the patient occurs on the same day (Claverly 1986). The American College of Surgeons defines it as "surgery that is performed under general, regional, or local anesthesia without overnight hospitalization (American College of Surgeons 1988).

Outpatient surgery is not new. Its earliest beginnings can be traced back to about 3000 BC through the Edwin Smith Surgical Papyrus that is one of the earliest known scientific documents of medical practice. It describes 48 surgical procedures performed

in ancient Egypt. Other early documentation of ambulatory care included the Greek and Roman use of temples as places of healing as well as worship in the first century AD. Ambulatory care was continued by religious orders in the Middle Ages and hospitals that eventually evolved from the Crusades. Church-dominated hospitals were widespread in Europe throughout the 15th century and included outpatient as well as inpatient care (Schneck 1984).

Due to rapid advances in medical care, Massachusetts General Hospital in Boston had an outpatient department by 1818 and by 1916 there were 495 outpatient departments in hospitals and 185 freestanding units (Schultz 1979). Outpatient services became widely developed by 1900. In 1909, Dr. James Nicoll of Royal Glasgow Hospital for Children conducted ambulatory surgery on approximately 8,000 pediatric patients, concluding that this approach was as satisfactory as inpatient surgery for a number of operative procedures (O'Neill and Templeton 1990, Schneck 1984).

Ambulatory surgery lay dormant for approximately 40 years thereafter, largely due to the lack of adequate anesthetic agents (Schneck 1984). It was not until the 1950s that interest was again revived (Kassity, McKittrick, and Preston 1982). The early 60s brought increased growth due to the benefits of early ambulation of post operative patients, an increased demand for inpatient beds by the more seriously ill, and the prospect of increased cost savings and convenience for both the physician and patient (Schneck 1984).

In 1968, a 10-year study was conducted at Columbus

Children's Hospital involving infants up to the age of 18 months who had elective outpatient surgical procedures performed. There were no wound complications or adverse side effects causing readmission, save for the rare case of transient laryngospasm. This was further evidence that ambulatory surgery was economically beneficial because it reduced time lost by the parents from work and was clearly less expensive for medical insurance programs. The concept of ambulatory surgery was gradually becoming established in all surgical specialties (O'Neill and Templeton 1990).

The late 60s also brought about site changes for outpatients. Prior to 1968, ambulatory surgery was hospital-based. Freestanding centers were opened as a consequence of physicians frustrated with the lack of hospital-based accommodations (Brinton 1988). The 80s brought staunch resistance to freestanding facilities from hospitals whose patient base was being eroded (Schneck 1984). Watching dollars literally walk out the door, hospitals realized they must rethink the delivery of ambulatory surgical services if they were to survive in this highly competitive environment.

The growth of ambulatory surgery in all settings has increased phenomenally in recent years. The American Hospital Association (AHA), in their 1993-94 edition of Hospital Statistics, reports a quadrupling of surgeries performed in the outpatient setting in the last decade (Hospitals & Health Networks, 1994). Currently, ambulatory surgery accounts for 50%

of all surgery performed in the United States (Detmer and Gelijns 1994). It has been estimated that by the year 2000, 70% of the patients now treated in acute care hospitals will be treated in alternative ambulatory settings (Michel and Myrick 1990). Ambulatory surgery has progressed largely because it has proven to be a viable, safe, and cost effective alternative to hospitalization that benefits patients, employers, physicians, and third party payers (Earnhart 1987).

Four interdependent factors have fueled this growth: advances in asepsis and antibiotics, new anesthetic agents, technology, and economics (Singer 1993, Davis 1993, Vaughan, Aluise, and McLaughlin 1991, Ermann and Gabel 1985, Schneck 1984). The vast armory of antibiotics that are available today have made it possible for patients to return home quite early by minimizing, preventing, or curing infection (Singer 1993). Improved anesthetic agents that decrease postoperative nausea and vomiting, drowsiness, and even awaken patients more easily have made ambulatory surgery safer and more acceptable to patients (Davis 1993).

Technological advances coupled with changes in operative technique have played a substantial role in boosting the efficacy of ambulatory surgery. The change from open to minimally invasive procedures through the use of endoscopes and laparoscopes are contributing significantly to the outpatient surgery drive. It has been predicted that 80% of all abdominal and thoracic surgery will be done laparoscopically within the

next five years. By 1995, endoscopic surgery is expected to account for 70-90% of many high-volume surgeries such as cholecystectomies, appendectomies, hysterectomies, herniorrhaphies, vagotomies, certain bowel and lung procedures, and various cancer stagings (Lumsdon, Anderson, and Burke 1992). How many of these procedures will translate into ambulatory surgery numbers remains to be seen, but it has been predicted that they will require between four and twenty-three hours of recovery (Davis 1993). The consequence is that some surgical specialties will virtually disappear from the inpatient setting, making an increase in the outpatient areas inevitable (Maple 1987).

Pressure from third party payers to shorten hospital stays has been a crucial driver in the move toward ambulatory procedures. Retrospective cost reimbursement for an ambulatory procedure vice prospective payment for an in-house stay has played a constraining role on inpatient surgeries, moving patients to alternative settings (Roos and Freeman 1989, Anderson 1992, Davis 1994, Detmer and Gelijns 1994). In 1992, more than 50% of all surgery performed was done so on an ambulatory basis (AHA, 1992). That figure was projected to be 60% by the mid 1990s (Maple 1987) and is projected to be 80% by the year 2000 (Swisher 1991). The current adoption of managed care and similar prepaid arrangements coupled with the application of utilization review and management will further promote the substitution of outpatient for inpatient care (Detmer and Gelijns 1994, Vaughan,

Aluise, and McLaughlin 1991).

Patient and provider convenience cannot be ignored when discussing the economics of care. Studies have shown that patient outcomes in the outpatient setting are at least equivalent to those of inpatient surgery. Ambulatory settings have proven to provide quality care, allowing physicians to focus on convenience and how to maximize their time in the operating room. A well-run ambulatory setting provides both (Detmer and Gelijns 1994, Ermann and Gabel 1985).

Patients are concerned with convenience in terms of lost work time and home recovery. They are also concerned with exposure to the iatrogenic hazards of hospitalization. Plus, today's patients are more educated health care consumers who want the most for their health care dollar in an environment reflective of wellness instead of illness (Maple 1987, Ermann and Gabel 1985).

As a result, freestanding ambulatory surgical sources have evolved as a cost-effective, consumer-oriented alternative to complex, bureaucratic hospital in-patient systems. Hospital-based ambulatory surgery programs have delayed their responses to the threat these centers pose and have finally realized they must develop ways to remain competitive in order to retain these patients (Vaughan, Aluise, and McLaughlin 1991). It is therefore necessary for the management of ambulatory surgical services to be at the strategic planning level in order to integrate the required organizational, physical, financial, strategic, and

operational elements (Anderson 1991, Vaughan, Aluise, and McLaughlin 1991).

Although there is a general silence regarding military health care, there exists a large body of literature concerning private sector health care reform involving health services delivery, the associated fiscal and managerial challenges (Hudak, Brooke, and Finstuen 1994), and movement toward standardized business practices. It seems feasible to evaluate these innovations for applicability to the Military Health Care System.

Hospitals were originally built with inpatient surgery in mind. This makes facilities planning a critical issue in developing new surgical strategies that can better accommodate the continuing outpatient movement. The idea of ambulatory surgery today requires a paradigm shift because it is a process of separating large, complex hospitals into much more highly focused production units. It is now necessary to adjust the processes and infrastructure of a delivery system to meet the needs of specific market segments (Vaughan, Aluise, and McLaughlin 1991). As a result, hospitals are "retooling" their existing facilities in order to manage care more effectively for both inpatients and outpatients (Anderson 1992).

For some, this involves separating the flow of surgical inpatients and outpatients as much as possible to improve convenience and efficiency. Current literature states that it is simply not enough to convert a wing or a floor of an existing facility to provide ambulatory surgery. Other changes must be

made such as dedicated operating rooms with independent scheduling or at least a dedicated time frame in which ambulatory surgeries can be performed without interruption, dedicated elevators, and convenient, private waiting and recovery areas (Ibid., Lumsdon, Anderson, and Burke 1992, O'Neill and Templeton 1990).

Dedicated operating rooms or operating room (OR) time is necessary in order to prevent lower priority ambulatory cases from being bumped by higher priority emergency procedures (Lumsdon, Anderson, and Burke 1992, Vaughan, Aluise, and McLaughlin 1991, Nathanson 1988) and to maximize surgeons' time. Trying to perform ambulatory surgeries and critical care cases in the same surgical suites creates intense professional and organizational conflict. A separate administrative and physical identity could possibly enhance doctor-hospital relations, achieve cost containment objectives, satisfy patient and family needs, and ultimately increase market share (Vaughan, Aluise,and McLaughlin 1991).

Scheduling is the framework for planning, directing, and controlling physician, staff, and patient flow (Ibid.). A major problem in hospital-based units is the use of first-come, first-served scheduling which makes staffing difficult, causes the use of additional supplies or even wastes them, and creates difficulties with equipment allocation (Nathanson 1988). To improve scheduling, Anderson, in his report of surgery unit 'best practices', recommends that schedulers have an in-depth knowledge

of clinical procedures, that the hospital use an automated scheduling system to track physician performance by the type of case, and that the automated equipment for scheduling be linked to the supply ordering system (Anderson 1992).

Streamlining the ambulatory process has also been shown to be time-efficient and cost effective. The establishment of Pre-Admission Units (PAUs), where all preoperative screening occurs at some point in time prior to the surgery, have not only been shown to be convenient and satisfying for the patient (Michel and Myrick 1990, MAMC CCD 1994) but have also demonstrated efficiency in saving hospital bed days (Rhodes 1993). These units prevent bottlenecks from occurring on the day of surgery because problems have been identified and addressed earlier in the process.

Another recent innovation is cost tracking for ambulatory services. With HCFA proposed cost-increase constraints around the corner, the ambulatory patient groups (APGs) classification system for ambulatory surgery may become reality (Lumsdon, Anderson, and Burke 1992). It is important that hospitals accurately assess their outpatient costs separately from inpatient costs in the face of this proposed fixed-price reimbursement as outpatient services on average have been predicted to account for 33% of hospital revenues by the mid 1990s (Lauffer 1992) and nearly 50% of a hospital's net patient revenues by the year 2000 (Anderson 1991). Top facilities identify costs by physician or procedure and track revenue streams by payer. Some form of flat-rate pricing mechanism may

be the best method to use (Anderson 1992).

The MHCS is in the midst of health care reform where change paradigm shifts mean survival. There no longer exists justification for still trying to mix inpatient, acute, intensive surgical procedures and outpatient elective ones (Vaughan, Aluise, and McLaughlin 1991). Military MTFs must develop a specific, independent, focused strategy that best meets the needs of the patients and medical staff in an increasingly ambulatory environment. Military leaders must become change masters as defined by Rosebeth Moss Kanter:

> The right people in the right place at the right time. The right people are the ones with ideas that move beyond the organization's established practice, ideas they can form into visions. The right places are the integrative environments that support innovation and encourage the building of coalitions and teams to support and implement visions. The right times are those moments in the flow of organizational history when it is possible to reconstruct reality on the basis of accumulated innovations to shape a more productive and successful future.

Now is the right time for the military medical system to institute change to its old surgical paradigm.

CHAPTER 2

METHODS AND PROCEDURES

Fiscal year (FY) 1994 surgeries performed at Madigan Army Medical Center were downloaded from two surgical information systems run by Operative Services. Two databases were required in order to capture the year's surgeries as the Automated Quality Care Evaluation Support System (AQCESS) was phased out in June of 1994 and Surgical Information System (SIS) was phased in. Surgical procedures are entered by Operative Services using Current Procedural Terminology (CPT) codes. All surgeries were eliminated that contained incomplete CPT codes and only primary procedures were considered. The two data bases were combined to yield approximately 9300 surgeries that were performed at Madigan in FY94.

The fields that were captured include CPT code, corresponding preoperative diagnosis, postoperative diagnosis, American Society of Anesthesiologists (ASA) Classification as defined in Appendix A, patient age, family member prefix (FMP) as defined in Appendix B, social security number (SSN), military status (i.e. active duty, dependent, retired), nursing unit from, and nursing unit to. The demographic data was gathered to facilitate the process of correct population targeting for

recommended solutions. ASA categories are important in the determination of ambulatory surgery medical eligibility. Class I and II patients (Appendix A) have historically been the best candidates for ambulatory surgeries, and in recent years even Class III patients have been accepted and approved for ambulatory surgery (Lauffer 1992).

A computerized, CPT-coded list of HCFA ambulatory surgery center (ASC) approved procedures was obtained from a HCFA fiscal intermediary. This list of procedures is used by HCFA to reimburse institutions for Medicare recipients when these procedures are performed in an ambulatory setting. The list of procedures is approximately 2500 strong.

A computer query was then run between the HCFA ASC reimbursement list of procedures and the MAMC inpatient surgery listing in order to identify and extract matching CPT codes. This produced a list of 4709 surgeries out of the 9300.

Same day surgeries needed to be eliminated from the data set. The list of surgeries was compared to the Inpatient Data System (IPDS) in order to determine length of stay. This could not be done at MAMC with the fields that had been obtained. The FMP and SSN fields from the data set of 4709 surgeries were forwarded to the Patient Administration Systems and Biostatistics Activity (PASBA) at the United States Army Medical Command in San Antonio, TX. Records reflecting one bed day were isolated from FY94 performed surgeries at MAMC and a separate data base created. This data base was run against the 4709 listing two

separate ways - by FMP and SSN. This was necessary because two verifiers were required to ensure record retrieval accuracy and many FMPs were incompletely coded causing a loss of records. The two data bases were combined in order to result in the least amount of lost records from improper FMP coding. All surgeries with one day LOS were thusly eliminated.

The list that emerged consisted of 1047 inpatient surgeries performed at Madigan that matched HCFA's list of ASC reimbursable procedures. The fields consisted of FMP, SSN, and Register Number. The Register Number was required in order to pull identified records for review.

At this point, the descriptive statistical assumptions were made that the records are normally and independently distributed in the population, that there is random selection in sampling, homogeneity of variance exists, and the X is fixed. Thus, a random selection of the 1047 records was made using Microsoft Excel. A subset of 104 records, approximately 10% of the subsample, were identified as representative and were pulled by register number and double checked by SSN. Several records on the list were still non-ambulatory surgical in nature such as cancer treatments, births, and circumcisions. This occurred because of the CPT code originally input into the SIS. These were calculated as the subset error rate which was also applied to the 1047 record population.

The records were manually reviewed by a Registered Nurse for medical indications of increased lengths of stay. Guidelines for

the criteria used as valid reasons for incurring greater than one day LOS originated from the Manual of Preoperative and Postoperative Care, 1983 and Anesthesia for Ambulatory Surgery, 1991, two surgery books containing chapters on ambulatory surgery complications and problems encountered in the postanesthesia period.

It is important to mention that there is a lack of uniform definition in the medical community concerning "complications". Even so, the use of complications as criteria for increased LOS is evidenced by investigations that have found that even minor problems may delay discharge or time to resumption of normal activities for ambulatory surgery patients (Freeman, et. al. 1988, Gold, et. al. 1989, Meridy 1982, Metter, et. al. 1987, and Pandit, et. al. 1987).

The Federated Ambulatory Surgery Association (FASA) established a definition of complications in 1981 separating them into major and minor. They define a major complication as an untoward response or abnormal condition having the potential for serious harm. They include hemorrhage, infection, serious anesthetic complications like persistent nausea and vomiting, any medical problem requiring hospitalization, and other potentially harmful occurrences (Anesthesia for Ambulatory Surgery, 1991).

A minor complication is considered to be an untoward response with minimal or no potential for serious harm and includes transient episodes of nausea and vomiting, weakness, headache, muscle aching, sore throat, and dizziness. These

complications may cause discomfort and anxiety in the patient but do not pose a threat to life or limb (Ibid., Manual of Preoperative and Postoperative Care, 1983).

Not classified as a complication is any anesthetic or surgical event that was a relatively common deviation from the norm and required no special treatment or action on the part of the surgeon or anesthesiologist and presented no substantive danger to the patient.

The criteria used in the records review included any documented evidence of either major or minor complications mentioned above plus any evidence of elevated temperature, sustained elevated blood pressure that was not present upon baseline admission vital sign documentation, or drug reaction. Also included were any intraoperative complications that could occur with the conduction of any surgery such as aspiration, electrocardiogram (ECG) changes, or reactions to anesthetic agents.

The forms used to obtain this documentation included the physician's operative note, anesthesia notes, nursing notes, discharge summary, operative reports, vital sign records, and post anesthesia care unit (PACU) notes.

Surgeries meeting the criteria for ambulatory treatment were coded one. Those not meeting the criteria (i.e. multiple system involvement, complications, patients already in house) were coded zero. The percentage of records meeting the criteria for surgeries that could possibly have been performed on an

outpatient basis in the subset was then applied to the larger subsample of 1047 records.

The average length of stay for surgeries meeting the criteria was calculated in the spreadsheet and applied against the FY94 variable rate for a general surgical bed day. This produced the resource expenditure for the subset of 77 records and the same procedure was repeated for the subsample containing 1047 records. The subsample's resource expenditure is the dollar value of FY94 inpatient surgeries that could possibly have been performed on an outpatient basis.

Reliability and Validity

The HCFA-approved list of ambulatory surgeries is regularly utilized by hospitals in the United States as a means of reimbursement and is well documented in the literature. The CPT codes being used are widely accepted by insurance companies, billing departments, Medicare, and hospital administrators as a valid list of procedures that should occur in an outpatient surgical setting.

The reliability of the analysis in this case remains questionable due to the data base system integration and coding difficulties. Reliability would be greatly enhanced with an integrated system whose fields and verifiers remained constant from preadmission to discharge. The methodology appears reliable in that, given integrated information systems, it should be reproducible for any military medical treatment facility

performing ambulatory surgeries.

Ethical Considerations

All reasonable efforts have been expended to protect the confidentiality of patient information. Surgical lists contained social security and register numbers that served as sources of verification when working with several different data information systems. These were eliminated when reporting. No names were used. Medical chart review was conducted in a secure area established for this purpose. Only pertinent demographic and resource utilization data was collected for reporting purposes.

CHAPTER 3

RESULTS OF THE STUDY

Out of the 104 records reviewed in the subset, 27 (26%) were considered errors. Errors consisted of non-surgical episodes of care, births, newborn circumcisions, cancer treatments, and any other similar occurrences not considered ambulatory surgical in nature. The remaining record pool consisted of 77 records that were binary coded 1 if meeting the criteria, 0 if not. Fifty of these records, or 65%, were surgeries matching the ambulatory criteria.

Bed days greater than one on each of these surgeries was multiplied against the FY94 variable rate for a general surgical bed day which is $1022. The actual records review yielded $89,936 in inpatient resources utilized for surgeries meeting the outpatient criteria.

Applying this methodology to the larger subsample of 1047 records, 272 were errors leaving a record pool of 775 records. Sixty-five percent of those records should have met the ambulatory surgery criteria resulting in 503 records. The ALOS of surgeries in the subsample was 1.14 days. The 503 record total was multiplied by the ALOS and the FY94 variable rate for a general surgical bed day. This yielded inpatient resource

utilization in FY94 of $587,504 expended for inpatient surgeries meeting the ambulatory criteria (see Table 1, pg. 25).

Demographically, 46 of the 77 records, or 60%, had Family Member Prefix 20, the Sponsor. Another 23 equaling 30% fell into the Spouse categories of FMP 30 and 31. The remaining 10% were eight Sponsor's Children. Extrapolating to the larger subsample of 1047 records, 643 would be the Sponsor, 322 would be Spouses, and the remaining 107 would be Sponsor's Children.

Table 1. Records Review Spreadsheet

ID	*FMP*	*ASA*	*LOS*	*BD>1*	*Cost*	*1 if AS, 0 if not*	*Procedure Nomenclature*	*ICD9/DRG*	*Complication*
1	20	1	2	1	1022	1	Excision epididymal cyst	0/632	N
2	20	1	2	1	1022	1	Ethmoidectomy, turbinectomy, intranasal arthrotomy	2263,2169/272	N
3	30	NL	5	N/A	0	0	Closed tib/fib reduction	7906/254	Y
4	20	3	2	1	1022	1	Cystoscopy with Bx (bladder lesion)	5733	N
5	01	2	3	2	2044	1	Removal internal fixation device	7865/0	N
6	30	1	2	1	1022	1	Uvulvopalatopharyngoplasty (UPPP)	0/477	N
7	20	NL	2	1	1022	1	Contrast arteriogram - leg/Swanz-Ganz insertion	8848,8964	N
8	20	3	5	N/A	0	0	Transurethral Resection of the Prostate (TURP)	0/602	N
9	20	2	12	11	11242	1	R 5th finger flexor digitorum profundus repair	0/229	N
10	20	NL	15	N/A	0	0	Exploratory laparotomy	0/270	Y
11	30	2	3	2	2044	1	Nerve procedure w/o complications	0/8	N
12	30	3	3	N/A	0	0	R knee I & D	8604/0	Y
13	20	2	2	1	1022	1	ORIF R Fibula Fx	7936/0	N
14	20	NL	2	1	1022	1	Hemorrhoidectomy	0/158	N
15	20	2	3	2	2044	1	R knee ACL reconstruction	0/222	N
16	30	N/A	23	N/A	0	0	Radical Neck	0/49	N/A
17	30	4	12	N/A	0	0	Removal Groshongcath - Colon CA - Chemotherapy	8605/0	Y
18	30	3	7	N/A	0	0	L total knee arthoplasty	0/209	N/A
19	20	1	2	1	1022	1	Septoplasty	2188/0	N
20	20	2	2	1	1022	1	TURP	0/602	N
21	20	4	5	N/A	0	0	TURP	0/602	N
22	20	NL	11	N/A	0	0	Appendectomy	0/165	Y
23	20	1	4	3	3066	1	Vasovasotomy	6382/0	N
24	20	N/A	30	N/A	0	0	Total laryngectomy & thyroidectomy - multiple Sx involvement	N/A	N/A
25	20	NL	2	N/A	0	0	Contrast Arteriogram	8848/0	Y
26	20	1	3	2	2044	1	Modified Brostum R ankle	0/219	N
27	20	2	3	2	2044	1	Laparoscopy with Bx	5421/0	N
28	30	2	5	4	4088	1	Hernia repair with mesh	5631/0	N
29	30	2	3	2	2044	1	Exploratory laparotomy with lysis of adhesions	0/545	N
30	20	2	2	1	1022	1	TURP	0/602	N
31	20	2	6	N/A	0	0	Incisional Herniorraphy (Complex - bladder involvement)	5359/0	N
32	20	2	2	1	1022	1	Rhinoplasty	2188/56	N
33	02	1	2	1	1022	1	Removal L proximal humerus osteochondroma	7762/0	N
34	20	2	3	2	2044	1	Bx R 2nd rib - manubrial junction lesion	7741/0	N
35	20	1	3	2	2044	1	Laparoscopic vag hyst with R salphingo-oophorectomy	5421/0	N
36	03	1	5	N/A	0	0	I&D parapharyngeal space abscess	4011/0	Y
37	31	2	4	N/A	0	0	Tubal reanastomosis	6673/0	Y
38	20	1	2	1	1022	1	TURP	0/602	N
39	20	1	2	1	1022	1	Laryngoscopy with Bx	3009/0	N
40	30	NL	5	N/A	0	0	L elbow reconstruction	8185/0	N

Table 1. (continued) Records Review Spreadsheet

ID	*FMP*	*ASA*	*LOS*	*BD>1*	*Cost*	*1 if AS, 0 if not*	*Procedure Nomenclature*	*ICD9/DRG*	*Complication*
41	20	1	2	1	1022	1	ORIF patella Fx	7939/0	N
42	30	2	14	N/A	0	0	L5-S1 diskectomy	8051/0	N/A
43	20	3	8	N/A	0	0	Radical retropubic prostatectomy	0/605	N
44	01	N/A	7	N/A	0	0	Colostomy reversal, appendectomy, Hirschsprungs disease	4652/471	N/A
45	20	2	2	1	1022	1	Placement of AMS 800, artificial urinary sphincter	5893/0	N
46	20	1	2	1	1022	1	Arthroscopy - ACL reconstruction	8026/0	N
47	30	2	16	N/A	0	0	Exploratory laparotomy with lysis of adhesions	3893/545	Y
48	02	1	2	1	1022	1	Bilateral cleft lip repair	2754/0	N
49	20	2	3	2	2044	1	Epineural repair - radial nerve	0/043	N
50	30	2	2	1	1022	1	Rotator cuff repair - acromioplasty	8363/0	N
51	20	2	4	1	1022	1	L proximal humerus Bx	7742/0	N
52	01	1	4	N/A	0	0	Closed rectal Bx - R/O Hirschsprungs - for GI obstruction	4824/0	N/A
53	20	1	2	1	1022	1	Local excision of pilonidal disease	8621/0	N
54	30	2	2	1	1022	1	Pelvic relaxation, ant/post repair, enterocele repair	7050/708	N
55	30	N/A	N/A	N/A	0	0	Hernia repair, R hemicolectomy, multiple procedures	5361/0	Y
56	04	1	1	0	0	0	Bilateral myringotomy	2001/0	N
57	20	1	2	1	1022	1	Vasovasotomy	6382/0	N
58	30	3-E	2	N/A	0	0	D&C	6909/0	Y
59	20	2	4	1	1022	1	Talocrural arthrodesis w fibular bone grafting & fixation	8111/0	N
60	20	1	2	1	1022	1	Hemorrhoidectomy	4946/0	N
61	20	3	2	1	1022	1	TURP	0/602	N
62	30	2	2	1	1022	1	R simple mastectomy	8541/0	N
63	30	N/A	29	N/A	0	0	Partial sacrectomy, loop colostomy, wound revision, debridmt	7789/0	N/A
64	30	3	4	N/A	0	0	Enterocele/rectocele repair, epidural cath placement	6186/0	N
65	20	1	2	1	1022	1	Maxillary LeFort I, Bilateral sagital split osteotomy (BSSO)	7664/0	N
66	20	2	3	N/A	0	0	Inguinal herniorrhaphy with mesh	5305/0	Y
67	20	1	8	7	7154	1	Excision osteoid osteoma R distal femur with I&D	7765/0	N
68	20	1	4	3	3066	1	Exploratory laparotomy w L subphrenic cyst removal	0/544	N
69	20	1-E	2	1	1022	1	ORIF L distal radius with iliac crest bone graft	7932/0	N
70	20	2	4	3	3066	1	Cystoscopy w transrectal ultrasonography prostatic needle Bx	5732/0	N
71	30	2	2	1	1022	1	R thyroid lobectomy	0/062	N
72	20	3	2	1	1022	1	TURP	0/602	N
73	20	2	2	1	1022	1	Arthroscopy, R knee	8026/0	N
74	30	1	2	1	1022	1	Laparoscopy	5421/0	N
75	20	N/A	N/A	N/A	0	0	R jugulodigastric lymph node exploration & excisional Bx	4011/0	N/A
76	01	1	2	1	1022	1	T&A	0/59	N
77	30	1	6	5	5110	1	Ureteroscopy, Polick and stent placement, stone extraction	5631/598	N
				1.1429	89936	50			

Total Extrapolated Cost = $587504

Table 1. (continued) Records Review Spreadsheet

ID	Comments
1	
2	
3	Pain control due to Hx drug abuse, monitor for compartmental syndrome
4	
5	SIS CPT is 27086, foreign body removal. SIS nomenclature S/P resection R proximal.
6	
7	SIS CPT 53447, urinary sphincter erosion. Wrong Reg. No.?
8	
9	Kept in house for OT
10	Psych - suicide attempt
11	SIS CPT is 25312, tendon transplant. SIS nomenclature L8, T1 palsy
12	Infection
13	
14	
15	
16	SIS CPT is 31535, laryngoscopy with Bx. Original Reg. No. wrong for proc.
17	Infection - Surgery not ambulatory, not stand alone
18	Not on SIS list
19	Original Reg. No. wrong for procedure performed
20	
21	Probably would not be AS with an ASA 4
22	Perforated appendix - peritonitis. SIS CPT listed as 49000, exp. laparotomy
23	
24	SIS CPT is 31535, laryngoscopy. SIS nomenclature laryngeal mass
25	Adverse drug reaction
26	
27	
28	
29	
30	
31	
32	
33	
34	Original Reg. No. surgery ex although still appears
35	SIS CPT 49000, exp. laparotomy
36	Fever - gone by day 2
37	Fever
38	
39	
40	SIS CPT 24615, open treatment of acute/chronic elbow dislocation
41	
42	FMP 30 not on SIS list - FMP 20 on list

Table 1. (continued) Records Review Spreadsheet

ID	Comments
43	SIS CPT 52610, TURP - This procedure more involved/extensive, not AS
44	SIS CPT 44346, colostomy revision with repair of paracolostomy hernia
45	
46	
47	Persistent N/V prior to admission - placed on TPN
48	Original Reg. No. wrong for procedure performed
49	
50	
51	FMP 30 on SIS list, same procedure. This FMP erroneous.
52	Not AS - 18 mo old admitted for impaction, R/O GI obstruction
53	
54	
55	Not AS - multiple procedures, prolonged ileus
56	Same day procedure - original Reg. No. erroneous
57	
58	Low H&H, transfused 3 units PRBCs
59	Original Reg. No. erroneous for procedure
60	
61	
62	
63	Not AS - multiple system involvement
64	ASA 3, may be too invovled to be considered AS
65	
66	Excessive bleeding
67	Pt. from AK. DOA 15th, tests (MRI, CT, etc.) conducted. Surg on 19th
68	
69	
70	
71	
72	
73	
74	
75	Inpt. with Hodgkins - multiple system involvement - not AS
76	Twenty yr old
77	S/P lithotrypsy w steinstrausse - possibly more involved than AS

CHAPTER 4

DISCUSSION

Limitations of the Study

This study involved only those surgeries conducted at Madigan Army Medical Center in Fiscal Year 1994. It is not a Department of Defense-wide study, nor a Department of the Army-wide study, although the procedures are reproducible which could serve to broaden its applicability.

Not captured in the data was the percentage of surgeries eliminated from consideration due to inaccurate or incomplete CPT and ASA coding. Also not captured were the number of surgeries eliminated for lack of meeting the established ambulatory surgery criteria. The total number of surgeries dropped could have been ascertained by subtracting the number of surgeries that qualified for consideration (4709) from the number of FY94 surgeries performed (9300) but there was no way to ascertain the difference between the two above situations. It would have been interesting to note the impact this number would have had on the overall resource picture had they been considered. This is because more complete and accurate CPT and ASA coding would have resulted in a larger medical record base for evaluation under the ambulatory surgery criteria. This may have produced a higher level of

qualifiers resulting in greater resource identification. The percentage these records are to the whole when resourced may have been significant.

Some surgeries that were eligible candidates for consideration may have been lost during the PASBA data exchange. PASBA captured all 1 day LOSs for FY94 surgeries conducted at Madigan and matched them by SSN and FMP to the list of 4709 surgeries that were HCFA ambulatory surgical center CPT code matches. Many of the FMPs were single digit coded and PASBA's system would not identify them. This meant that if an individual had another surgery that was greater than 1 day LOS and their SSN matched, that record would also be eliminated. It is unknown the number of surgeries lost in this manner.

Another limitation of the study is that there is no breakdown of categories within FMPs. For example, FMP 20 is assigned to the Sponsor. This could mean an Active Duty or Retired Active Duty individual. Age coupled with FMP becomes important when addressing solutions and attempting to gear them to the correct population.

The original field selection in SIS contained an "Age" field in order to discern the difference, however at the end of the process, this field could not be used as a verifier and was dropped as data was returned from PASBA. Age could have been noted by hand during the records review and the field added once again, but that detail was not identified until after the review was completed.

It is important to note that only surgeries were considered in this study. Further investigation would be required to ascertain similar practices in other areas such as medicine. It is also important to note that Madigan's FY94 general surgery variable reimbursement rate was used in order to ascertain inpatient resource utilization as opposed to the Congressionally mandated Diagnosis Related Group (DRG) rate of today. Use of this variable rate was consistent with the year group studied.

Difficulties

Many difficulties were encountered with this study. The initial difficulty appeared in data retrieval from Operative Services. The hard drive on the AQCESS system crashed and many records were lost in the retrieval. The actual count of records lost is unknown. This created a problem when trying to pull records for the manual review as some were not in the system.

Incomplete and incorrect coding caused some problems. All records that were not CPT coded in the Operative Services data bases were eliminated as were all those that were incompletely coded. Many surgeries had no ASA code resulting in elimination as well. It could not be ascertained, from those having no ASA code, whether or not they would have been good candidates for ambulatory surgery as this code is used as a major indicator for such consideration.

Also, CPT codes could not be used as verifiers at any time during the process. Records were initially input using CPT

codes, but if they were admissions, they were finalized as International Classification of Diseases, 9th Edition (ICD9) and DRG codes. This made record verification possible only by SSN, FMP, and Register Number.

The general incompatibility of information systems at Madigan proved to be another barrier to successful data retrieval and accuracy. It was discovered that if a patient's disposition changed post surgery, the change was not updated in the Surgical Information System. If the patient was admitted, a new record was initiated in the Composite Health Care System (CHCS). The two systems do not interface. This made these fields unreliable for determining whether or not the patient actually incurred a length of stay or was a same day admission. This yielded inaccurate and unreliable information in the "nursing unit to" field. True patient disposition could not be ascertained in this manner.

Another difficulty involved current federal reimbursement methods which require that all patients be listed as admissions even though they may have undergone a same day procedure. This caused a need to eliminate all patient stays of one day or less. In order to accomplish this, the data had to be matched against data in the IPDS. MAMC was unable to perform this function due to the available fields. The only fields that could be used for verification were Bed Days, ICD9 Code, FMP, and SSN. Since the original data retrieval used CPT codes and did not include LOS, Bed Days and ICD9 Code fields could not be used. Using SSNs

alone would identify any member of the patient's family using that SSN. Therefore, verification using FMP was necessary to ensure like data matches of records was occurring. The data was subsequently forwarded to PASBA with instructions to eliminate all 1 day LOS.

It was difficult relaying to PASBA over the phone how they could be of service in a way that would translate into usable information. Management Information employees indicated that this frequently occurs when working with another's data, as the computer language required to obtain results is not the same as conversational communication. The data that was initially returned was not "clean" in that it contained many same day surgeries. This was noted when attempts were made to pull the medical records from Inpatient Records and they could not be located. A second request was initiated and subsequently resulted in significant time delays at a crucial point in the life cycle of the study.

Improperly entered FMP codes became a problem when trying to retrieve data from PASBA. FMP codes are two digit numbers for which there are two numeric fields in which they are entered. If a single digit is entered, it tracks to the right. PASBA's data system does not identify these and there was no way to tell whether the FMP was supposed to be, for example, 20 or 02. For single digit FMP records, there became no way in the data exchange to preserve those SSNs reflecting two surgeries, one that may have been same day, from a second that may have had a

LOS greater than one day.

The greatest problem brought to light in trying to complete this study is the overall effect of system incompatibility on management decisions. This study shows that a patient cannot be followed through the system without great difficulty and that the data involving that patient may not be captured accurately. In a managed care environment, where military management is basing critical decisions of service provision upon unreliable data, this becomes a grave concern. The task of bringing this project to close was accomplished solely because it is a graduate requirement. It is quite likely that an individual performing in their regular job would be unable to commit the amount of time required to obtain meaningful data of this type. System standardization, where the data involving patient care can be followed from the Composite Health Care System to the Surgical Information System and/or the Clinical Information System to the Patient Administration System and Biostatistical Activity and back in the same manner, is essential if the military is to rely on this data for decision making purposes.

The final difficulty came at the close of the study when the final subsamble of 1047 records was obtained. This should have been all FY94 inpatient surgeries conducted at MAMC that matched the HCFA approved list for ASCs having greater than one day LOS. When the subset of 10% of this subsample was reviewed, 26% of the records were found to be non-surgical due to CPT codes originally entered in SIS. This created a less than 10% records review once

all errors were extracted. The subset used consisted of only 77 records instead of 104. Due to time constraints, additional records could not be randomly selected, pulled, and reviewed in order to reach the desired number. The reader is hereby cautioned that inferences to the subsample of 1047 records were made from this small sample.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

It appears evident, although there were significant difficulties with completion of this study, that there exists inpatient resource use that might more appropriately be redirected to the outpatient arena.

It is therefore recommended that this study be reaccomplished using an integrated management information system capable of tracking patients and their medical data from entry into the system to record completion and reporting. Like fields could be used from start to finish without loss of records or data and a more accurate view of inpatient resources expended could be obtained. This would provide a better operating base when performing cost benefit analyses against alternative forms of care.

In the interim, it is recommended that the nuances and constraints of SIS become more widely publicized to Madigan staff proposing research projects. For instance, CPT coding is used in the civilian sector for billing outpatient procedures only. At Madigan, CPT coding is input by clinicians in Operative Services for inpatient procedures. It has no impact on

reimbursement. Although this system seems to meet the needs of Operative Services, these clinicians are not trained coders and the code may not necessarily reflect the final procedure performed. Since this was found to be true in many instances in the study, the reliability of the data base for other than Operative Services use becomes questionable. Additionally, the SIS is not updated with changes that occur post input and listed procedures are not necessarily all surgeries. For the purposes of this study, it may have been more advantageous to utilize another qualifier other than CPT code and start the study from a different information system data base such as the Clinical Information System. If this system is going to continue to be used for research, it is recommended that more accurate CPT coding and FMP documentation be stressed.

If the research were to be accomplished at Madigan in the same manner using the same systems and methodology, a few suggestions to enhance the process are recommended:

1. Download the data from the Surgical Information System through the Information Management Department instead of Operative Services.

2. Eliminate the fields that cannot be used as verifiers, like the "nursing unit to and from" fields, in order to simplify the amount of data being manipulated. Preserve the "status" and "age" fields in case they could be carried throughout the process with future computer enhancements. These fields remain important when addressing delivery of specific services, in the evaluation

of service utilization, and other business plan decisions that might be made.

3. If the "status" and "age" fields cannot be preserved throughout the process, they must be brought back into it at some point before the records review. Under current managed care reimbursement strategies, population targeting becomes increasingly important and the differences between active duty, retiree, Medicare eligible, and dependent categories for healthcare utilization becomes significant. Population targeted recommendations could not be made from the results of this study because the "status" field, which was the FMP differentiator, was not carried throughout.

4. Madigan's Inpatient Data System should have been able to eliminate all surgeries having one bed day, avoiding the use of PASBA. In order to accomplish this, the fields required need to be identified before the entire process begins and data is downloaded from SIS. This would have kept the study totally in-house saving research time, effort, and possibly preserving more valuable fields and records.

5. The patient's Register Number needs to be included as one of the original fields downloaded from SIS if it is present in that system. The Register Number identifies a specific date of treatment for a particular Social Security Number, thereby ensuring accuracy when retrieving records for review.

In spite of the systems and data difficulties, this study suggests that opportunities for alternative resource use exist at

MAMC. This study's results do not warrant population targeted recommendations, but instead, that overall outpatient services be fully explored and evaluated to include the development of an effective ambulatory surgery center within the hospital. The literature suggests that hospital-integrated ambulatory surgical models such as Madigan's that continue to funnel outpatients through existing inpatient processes will not survive.

A hospital-dedicated model suggests that ambulatory surgical services be a separate facility or unit. Strategies for successful hospital-dedicated centers are numerous to include adjacent proximity to the operating room suite, a comfortable, non-threatening environment for patients and families, and preoperative evaluation and post-operative care carried out in the same general area. In a hospital-integrated model such as Madigan's these functions are split because patients are processed separately yet use the regular operating rooms and are discharged from the recovery room.

A strategy that fits this model that might be successful at Madigan includes dedicated operating rooms and schedules that are protected from encroachment. The portion of the Post-Anesthesia Care Unit (PACU) that is currently not in service could be utilized to ambulatory surgery patients only. These changes could be accomplished through the appointment of a highly respected, full time medical director for ambulatory surgical services.

A hospital-dedicated center would additionally require

strong leadership and hospital/physician unity. New medical staff organizational relationships reflecting this unification need to be developed that include responsibility for credentialing, privileges, quality assessment, discipline, and operational management and leadership. Medical professional integration would foster institutional support and ensure quality services are delivered and that patient interests are protected (Berger and Kurtz 1991, Vaughan, Aluise, and McLaughlin 1991).

The ability to accurately account for and control costs for ambulatory surgical services is a must. Labor (which includes the ability to track physician cost by case mix and procedure time), equipment and supplies, and facility costs are the major ambulatory surgery cost parameters (Nathanson 1988). Radiologic and laboratory services must be considered as well. A cost reporting system that captures true cost, such as cost accounting, product costing, or flat-rate pricing, must be obtained and military institutions allowed to use them.

Madigan must also possess other monitoring capabilities if this endeavor is to succeed. The ability to establish and monitor factors that are critical to the success of delivering the service are required (Zasa 1990). Continual, consistent monitoring of factors considered to be critical to the success of delivering ambulatory surgical services can ensure the business plan is being followed, that problem areas are identified and corrected, and provide a data base from which to examine trends and plan future actions.

APPENDIX A

AMERICAN SOCIETY OF ANESTHESIOLOGISTS (ASA) CLASSIFICATION SYSTEM

Class 1 - The patient has no organic, physiologic, biochemical, or psychiatric disturbance. The pathologic process for which the operation is to be performed is localized and does not entail a systemic disturbance.

Class 2 - Mild to moderate systemic disease disturbance caused either by the condition to be treated surgically or by other pathologic processes.

- no or slightly limited heart disease
- well-controlled hypertension
- anemia
- cigarette use without significant respiratory disease
- well-controlled diabetes mellitus
- mild obesity
- well-controlled asthma
- chronic bronchitis
- age < 1 year or > 70 years
- pregnancy

Class 3 - Severe systemic disturbance or disease from whatever cause, even though it may not be possible to define the degree of disability with finality.

- angina
- poorly controlled hypertension
- past myocardial infarction with current mild to moderate symptoms
- symptomatic respiratory disease (eg, asthma, COPD)
- diabetes with vascular or other complications
- massive obesity

Class 4 - Indicative of the patient with severe systemic disorders that are already life threatening, not always correctable by operation.

- unstable angina
- congestive heart failure
- debilitating respiratory disease
- hepatorenal failure

Class 5 - The moribund patient who has little chance of survival but is submitted to operation in desperation.

- ruptured aneurysm with severe shock
- major cerebral trauma with rapidly rising intracranial pressure
- massive pulmonary embolus

Modifier: Emergency Operation (E)

Any patient in one of the above classes who is operated upon as an emergency is considered to be in poorer physical condition.

APPENDIX B

Family Member Prefix Classifications

Rule	FMP	Rule
1	01	If the patient is - Sponsor's child
2	02	If the patient is - Sponsor's second oldest child
3	03	If the patient is - Sponsor's third oldest child
4	04, 05, etc. through 19	If the patient is - Sponsor's fourth oldest child
5	20	If the patient is - The Sponsor
6	30-39 series	If the patient is - Sponsor's spouse or former spouse
7	40	If the patient is - Sponsor's mother or stepmother
8	45	If the patient is - Sponsor's father or stepfather
9	50	If the patient is - Sponsor's mother-in-law
10	55	If the patient is - Sponsor's father-in-law
11	60-69	If the patient is - Another relative
12	90-95	If the patient is - A beneficiary assigned by statute
13	98	If the patient is - A civilian brought to the MTF in an emergency
14	99	If the patient is - All others not elsewhere classified

Source: U.S. Army Regulation 40-66, pg. 15, Ch. 4, Table 4-1

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